REMARKS

Summary of the Office Action and Response:

In the present application, claims 1-26 are pending and stand rejected.

Drawings:

In the Office Action, the drawings were acceptable for examination purposes only, and formal drawings will be required when the application is allowed.

Objections under 37 C.F.R. §1.75(c) and Response:

Claims 5, 12, and 20 were objected to under 37 C.F.R. §1.75(c) as being required to be cancelled, amended to be placed in proper dependent form, or rewritten to be in independent form. Additionally, in claims 5, 12, and 20, Examiner reasoned that the term "selected ones of the design variables" is awkward, and accordingly, suggested that "selected design variables" should be used.

In response, Applicant respectfully traverses the Examiner's rejections. 37 C.F.R. §1.75(c) states that "one or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application". Claims 5, 12, and 20 refer back to claims 4, 11, and 19 respectively. Further, claims 5, 12, and 20 further require the method/apparatus of claims 4, 11, and 19 to have the operation/ability to transform design variable having assigned constant values to design variables having values variably assigned, and vice versa, thereby further limiting the

method/apparatus of claims 4, 11, and 19. Accordingly, claims 5, 12, and 20 are in proper dependent form as prescribed by 37 C.F.R. §1.75(c).

Additionally, Applicant thanks the Examiner for the suggestion, but Applicant respectfully declines the suggestion because Applicant feels that the use of the term "selected ones of the design variables" is not awkward and is appropriate for claims 5, 12, and 20. Furthermore, the term "selected ones of the design variables" is fully supported by the specification as originally filed.

Claims 6, 13, and 21 were objected to under 37 C.F.R. §1.75(c) as being required to be cancelled, amended to be placed in proper dependent form, or rewritten to be in independent form. Additionally, in claims 6, 13, and 21, Examiner reasoned that the term "to reuse" is ambiguous, and accordingly, suggested that "that indicates where to incorporate" should be used.

In response, Applicant respectfully traverses the Examiner's rejections. As previously discussed with respect to claims 5, 12, and 20, 37 C.F.R. §1.75(c) states that "one or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application". Claims 6, 13, and 21 refer back to claims 1, 8, and 16 respectively. Further, claims 6, 13, and 21 further require the method and apparatus of claims 1, 8, and 16 to have the operation/ability to receive identification of a point or an area of the second mechanical design to reuse the subpart of the first mechanical design in the second mechanical design, thereby further limiting the method/apparatus of claims 1, 8, and 16. Accordingly, claims 6, 13, and 21 are in proper dependent form as prescribed by 37 C.F.R. §1.75(c).

Additionally, Applicant thanks the Examiner for the suggestion, but Applicant respectfully declines the suggestion because Applicant feels that the use of the term "to reuse" is not ambiguous and is appropriate for Claims 6, 13, and 21. As the Examiner is aware, it well established that the claims are to be given their ordinary and accustomed meaning. Accordingly, to reuse may be defined as "to use again". Webster's II New Riverside University Dictionary 1005 (1994).

Claim rejections under 35 U.S.C. §112, first paragraph and Response:

Claim 1 was rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Examiner reasoned that the limitations "replicating a sub-graph" and "merging the replicated sub-graph..." were not adequately discussed in the specification.

In response, Applicant respectfully traverses the Examiner's rejections. Applicant respectfully asserts that the limitations of "replicating a sub-graph" and "merging the replicated sub-graph..." are adequately discussed to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

It is well established that the Examiner has the initial burden to establish a reasonable basis to question the enablement. A "specification disclosure which contains a teaching of the manner and process of making and using an invention in terms which correspond in scope to those used in describing and defining the subject

matter sought to be patented **must be taken as being in compliance with the enablement requirement of 35 U.S.C. 112, first paragraph**". (emphasis added) MPEP §2164.04. **Factors, reasons, and evidence** that lead the Examiner to conclude that the specification fails to teach how to make and use the claimed invention without undue experimentation should be explained. In particular, "**specific technical reasons are always required**." MPEP §2164.04 Applicant respectfully asserts that the Examiner has not met this burden.

Thus, for at least the reasons set forth above, limitations of claim 1 are described in the specification using languages and terminologies at a level that is consistent with the manner persons skilled in the relevant art present their works to one another, thereby satisfying at least the enablement requirements of 35 U.S.C. §112, first paragraph.

Claim 2 was rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Examiner reasoned that the limitation "identifying the sub-graph for replication" was not adequately discussed in the specification.

Here again, in response, Applicant respectfully traverses the Examiner's rejections. Applicant respectfully asserts that the limitations of "identifying the sub-graph for replication" is adequately discussed to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As discussed above with respect to claim 1, Applicant asserts that the Examiner has not met the required burden.

Contrary to the Examiner's reasoning, in the specification, Applicant draws the Examiner's attention to page 11, where Applicant discusses the limitations to at least satisfy the enablement requirement of 35 U.S.C. §112, first paragraph.

Thus, for at least the reasons set forth above, limitations of claim 2 are presented in the specification using languages and terminologies at a level that is consistent with the manner persons skilled in the relevant art present their works to one another, thereby satisfying at least the enablement requirements of 35 U.S.C. §112, first paragraph.

Claims 8, 9, 16, 17, 25, and 26 recite similar limitations. Accordingly, for at least the reasons set forth above with respect to claims 1 and 2, Applicant respectfully traverses the rejections for claim 8, 9, 16, 17, 25, and 26 under 35 U.S.C. §112, first paragraph.

Claim 24 was rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Examiner reasoned that the limitation "a first and second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions" was not adequately discussed in the specification.

In response, Applicant respectfully traverses the Examiner's rejections. Applicant respectfully asserts that the limitations of "a first and second processor

communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions" is adequately discussed to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. As previously discussed, Applicant respectfully asserts that the Examiner has not met the initial burden establishing a reasonable basis to question the enablement.

Even if Applicant assumes for arguendo that the burden was met by the Examiner, Applicant draws the Examiner to page 13-14 of the specification where the limitation of "a first and second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions" is described. In general, one skilled in the art will recognize that this limitation pertains to multi-processor environments incorporating the invention. Multi-processor environments have been known for a relatively long period. For example, at minimum, it is well known that early as the 1980's a multi-processor super computer was developed by Cray, Inc. of Seattle, Washington, known as Cray X-MP™. Thus, for at least this reason, Applicant respectfully assert that limitations of claim 24 are presented in the specification using languages and terminologies at a level that is consistent with the manner persons skilled in the relevant art present their works to one another, thereby satisfying at least the enablement requirements of 35 U.S.C. §112, first paragraph.

Thus, for at least the reasons set forth above, claims 1, 2, 8, 9, 16, 17, 24, 25, and 26 contain subject matter which was described in the specification in such a way as

to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 2-7, 9-15, and 17-24, depend from claims 1, 8, and 16 incorporating their limitations. Thus, by virtue of at least their dependency on claims 1, 8, and 16, claims 2-7, 9-15, and 17-24, contain subject matter, which was described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Finally, on this matter, Applicant respectfully reminds the Examiner that the "examiner should always look for enabled, allowable subject matter and communicate to applicant what that subject matter is at the earliest point possible in the prosecution of the application." MPEP §2164.04

Claim Interpretations:

Examiner interprets "replication" and "replicating" as being equivalent to making an exact copy.

Examiner interprets "merging" two graphs as being equivalent to connecting two graphs.

Examiner interprets "dependent graph of a design" as being equivalent to a data structure that supports Euler or "Euler-like" operations on boundary models. (See Mäntylä, p. 174) In response, Applicant respectfully traverses this interpretation because as is even stated in the reference provided by the Examiner, Silvia Ansaldi et al., Geometric Modeling of Solid Objects by Using a Face Adjacency Graph Representation, 19 Proceedings of the SIGGRAPH '85 Conference on Computer

Graphics 131 n.3 (1985) (*Ansaldi*), that primitive Euler operators as "basic design tools is often impractical and highly inefficient." (See *Ansaldi* page 134, col. 1) Furthermore, Euler or "Euler like" operations are directed toward verifying topological information regarding a boundary representation as described by the Euler operators. (See *Ansaldi* page 133, col. 1) . Applicant draws the Examiner's attention to specification of the present invention where Applicant describes graphs having information building blocks, such as, for example, numbers, lines, points, and so forth, and further including design variables, such as, for example, length of, perpendicularity, parallel relationships, and so forth. (See specification page 7, and Figure 2) Thus, interpreting "dependent graph of a design" as being equivalent to a data structure that supports Euler or "Euler-like" operations on boundary models is too restrictive.

Examiner interprets "modeling information" (claims 1, 8, and 16) as being equivalent to node, segment or face identification or position data. Please see above discussion regarding Euler or Euler-like operators.

Examiner interprets "design variables" (claims 3, 5, 7, 10, 12, 14, 18, 20, 22) as being variables derived from "modeling information", variables such as length of line, orthogonal direction vector for a face, etc. Please see above discussion regarding Euler or Euler-like operators.

Claim rejections under 35 U.S.C. §101 and Response:

Claims 1-7 and 26 were rejected under 35 U.S.C. §101 because the claimed invention is directed to an abstract idea and a mathematical algorithm, both of which are non-statutory subject matter. Examiner cites In re Warmerdam, 33 F.3d 1354 (Fed. Cir.

1994) and AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1360. Examiner reasoned that Applicant's inventions in claims 1-7, and 26 are abstract ideas (mathematical algorithms from the field of graph theory) for manipulating graphs. Additionally, Examiner reasoned that under In re Warmerdam, such inventions are not statutory, and that all dependent claim inherit this defect.

In response, Applicant respectfully traverses the rejections. In the cases cited by the Examiner, the court's inquiry focuses on whether a mathematical algorithm is applied in a practical manner to produce a useful result. AT&T Corp. v. Excel Communications, Inc., 172 F.3d at 1360. As filed, independent claims 1 recites the in part the following:

> replicating a sub-graph from a first dependent graph of **a first mechanical design, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first mechanical design;**
> merging the replicated sub-graph into a second dependent graph of **a second mechanical design to reuse the subpart of the first mechanical design in the second mechanical design.**

As a result, even if Applicant assumes for arguendo that the claim was drawn to a mathematical algorithm as reasoned by the Examiner, Applicant asserts that the mathematical algorithm is applied in a practical manner to produce a useful result. That is, the useful result reusing a subpart of one mechanical design in another mechanical design.

For the record, Applicant disagrees that the recitation of above limitations constituting recitation of an abstract idea and a mathematical algorithm. However, in view of the "practical application" discussed above, it is an issue that needs not be addressed.

Claim 26 recite similar limitations.

Nevertheless, in order for prosecutorial expediency, Applicant has amended independent claims 1 and 26 to further define the invention. Accordingly, Applicant respectfully requests withdrawal of the rejection to claims 1 and 26.

Claims 2-7 depend from independent claim 1 incorporating its limitations. Thus, by virtue of at least their dependency on claim 1, claims 2-7 also recite subject matter.

Claims rejections under 35 U.S.C. §102 and Response:

Claims 1-26 were rejected under 35 U.S.C. §102(b) as being anticipated by Martti Mäntylä et al., Challenges in Feature-Based Manufacturing Research, 39 Communications of the ACM 77 n.2 (Feb. 1996) (*Mäntylä_1*). In response, Applicant respectfully traverses the Examiner's rejections.

In general, the present invention is directed towards facilitating reuse of a subpart of one mechanical design in another mechanical design utilizing a computer aided design (CAD) tool. Accordingly, amended independent claim recites in pertinent part the following:

> **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool**, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first mechanical design; and
>
> **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**.

Independent claims 8, 16, 25, and 26 recite similar limitations. As a result, the present invention advantageously at least enables a designer to be able to efficiently explore the interrelationships between various subparts of a modeled design and its dependent

graphs, thereby allowing the designer to efficiently leverage on the reuse support offered by the CAD tool.

The Examiner reasons that *Mäntylä_1* teaches the limitations of claim 1 by citing Figs. 3, 5, 9, 10, and 11. However, Figs. 3, 5, and 9-11 does not teach or suggest the **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**, as claimed in the present invention.

In general, *Mäntylä_1* is directed towards issues and methods in applying features in manufacturing preparation and management. (See page 77) Accordingly, Fig. 3 illustrates feature types organized in a feature taxonomy having classes and instances of information implemented in an object-oriented environment. Fig. 5 illustrates process models realized as process taxonomy linked to various taxonomies in an object-oriented implementation. (See page 79, col.1) Fig. 9 illustrates a face-adjacency graph. (See page 83, col. 2) Fig. 10 illustrates two different feature models that may represent a single part showing a volume-based method that can produce overlapping sets of features. (See page 84, col. 1) Fig. 11, illustrates dividing a part into several smaller components (cells) and combining each cell into manufacturing features. (See page 84, col. 1)

However, Applicant cannot find any disclosure in *Mäntylä_1* that can be read as teaching or suggesting the **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging**

the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design, as claimed in the present invention.

Thus, for at least the reasons set forth above, the present invention is not anticipated by *Mäntylä_1*, and each of the independent claims 1, 8, 16, 25, and 26 is patentable over *Mäntylä_1*.

Claims 2-7, 9-15, and 17-24 depend from independent claim 1, 8, and 16 incorporating their limitations. Thus, by virtue of at least their dependency on claims 1, 8, and 16, claims 2-7, 9-15, and 17-24 are patentable over *Mäntylä_1*. In addition, claims 2-7, 9-15, and 17-24 include numerous limitations that render these claims further patentable over *Mäntylä_1*.

Claims 1-7 and 25-26 were rejected under 35 U.S.C. §102(b) as being anticipated by *Ansaldi*. In response, Applicant respectfully traverses the Examiner's rejection.

As previously discussed with respect to *Mäntylä_1*, claims 1, 25, and 26 in part, recite the limitations of **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**, as claimed in the present invention.

The Examiner reasons that *Ansaldi* teaches the limitations of claim 1 by citing Figs. 1-4. However, Figs. 1-4 does not teach or suggest the **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided**

design (CAD) tool or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**, as claimed in the present invention.

In general, *Ansaldi* is directed towards a relational graphical structure based on boundary representations of solid models based on face adjacency. (See Abstract) Faces of a solid model are selected as object defining entities and the "edge-face relation as the fundamental relation between primitive object entities". (See page 131, col. 2) Accordingly, this relational model is called a face adjacency graph encoding "vertices in the form of hyperarcs, which associate each vertex with the set of faces which are concurrent into it." (See page 131, col. 2) The face adjacency graph encoding is illustrated in Fig. 1. Further, *Ansaldi* describes validity conditions for the solid models for five constructive Euler operators, and these Euler operators are illustrated as face adjacency graph encoding graphs in Figs. 2-4. However, Figs. 1-4 does not teach or suggest the **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**, as claimed in the present invention.

Thus, for at least the reasons set forth above, the present invention is not anticipated by *Ansaldi*, and each of the independent claims 1, 25, and 26 is patentable over *Ansaldi*.

Claims 2-7 depend from independent claim 1 incorporating its limitations. Thus, by virtue of at least their dependency on claims 1, claims 2-7 are patentable over *Ansaldi*. In addition, claims 2-7 include numerous limitations that render these claims further patentable over *Ansaldi*.

Claim rejections under 35 U.S.C. §103(a) and Response:

Claims 8-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Ansaldi*. In response, Applicant respectfully traverses the Examiner's rejections.

Examiner reasons that *Ansaldi* teaches that "... we designed an experimental geometric modeling system for defining and manipulating the boundary of three-dimensional objects with planar faces, so as to demonstrate the practical advantages deriving from the use of our model in a CAD application." (p. 131, last paragraph) Additionally, Examiner reasons that *Ansaldi* does not teach the use of a recordable medium having a plurality of programming instructions. The Examiner goes on to take official notice that it was obvious and well known to one of ordinary skill in the art to utilize a recordable medium.

Even if it was obvious and well known to one of ordinary skill in the art to utilize a recordable medium, *Ansaldi* is nevertheless deficient in that it does not teach or suggest the **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**, as claimed in the present invention.

Thus, for at least the reasons set forth above, independent claims 8, and 16 are patentable over *Ansaldi*.

Claims 9-15 and 17-24 depend from 8 and 16 incorporating their limitations. Thus, by virtue of at least their dependency on claims 8 and 16, claims 9-15 and 17-24 are patentable over *Ansaldi*. In addition, claims 9-15 and 17-24 include numerous limitations that render these claims further patentable over *Ansaldi*.

Claim 24 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Mäntylä_1*. In response, Applicant respectfully traverses the Examiner's rejections.

The Examiner reasons that, referring to rejections under 35 U.S.C. §102(b) above and that it would have been obvious to one of ordinary skill in the art at the time of the invention to use a personal computer that had both a CPU, as well as graphics-specific processor embedded in a "graphics card" in order to speed up the execution time of the software, claim 24 is unpatentable over *Mäntylä_1*. As previously described with respect to rejections under 35 U.S.C. §102(b), even if it would have been obvious to one of ordinary skill in the art at the time of the invention to use a personal computer that had both a CPU, as well as graphics-specific processor embedded in a "graphics card", it does not cure the deficiencies of *Mäntylä_1*. That is, *Mäntylä_1* does not teach or suggest the **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**, as claimed in the present invention.

Thus, for at least the reasons set forth above, independent claim 24 is patentable over *Mäntylä_1*.

Conclusion:

In view of the forgoing, Applicant respectfully submits that all claim 1-26 are in condition for allowance. Early issuance of the Notice of Allowance is respectfully requested.

The Commissioner is hereby authorized to charge shortages or credit overpayments to Deposit Account No. 501569. A Fee Transmittal is enclosed in duplicate for fee processing purposes.

Respectfully submitted,
COLUMBIA IP LAW GROUP, PC

Dated: July 29, 2002

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph beginning at page 2, line 8 has been amended as follows:

--The fact that linear sequences do not adapt well to reuse analysis is especially problematic for CAD tools, as increasingly, mechanical designers desire to be able to reuse various subparts of their mechanical designs, in particular, the "standard" or "common" building block subparts employed in otherwise highly complex mechanical designs. Thus, a more effective and efficient approach to expressing mechanical designs and facilitating manipulation of the mechanical designs to allow different subparts of one mechanical design to be easily reused in another, is desired.--

Paragraph beginning at page 3, line 4 has been amended as follows:

--A mechanical design reuse method includes having a CAD tool replicates a subset of a first modeling representation of a first mechanical design, in response to having received instructions that identify a subpart of the first mechanical design. The reuse method further includes having the CAD tool merges the replicated subset into a second modeling representation of a second mechanical design to effectuate the reuse of the identified subpart of the first mechanical design in the second mechanical design.--

Paragraph beginning at page 6, line 4 has been amended as follows:

-- Referring now **Figure 1**, wherein a block diagram illustrating an overview of the present invention in accordance with one embodiment is shown. As illustrated, CAD tool **100** includes modeler **102** and browser **104**. As in prior art, modeler **102** models mechanical designs (hereinafter, simply designs), while browser **104** facilitates display of the modeled designs and related information for the designer, as well as facilitates input by the designer. However, unlike prior art, in accordance with the present invention, modeler **102** models designs employing dependent graphs, and using data **106a-106b** suitably organized for the dependent graph approach, to be described more fully below, whereas browser **104** not only facilitates display of the designs **108a-108b** and their dependant graphs **110a-110b**, but facilitates their displays in a novel coordinated manner. As will be readily apparent from the description to follow, the present invention advantageously enables a designer to be able to efficiently reuse subparts of one design in another design. In particular, the present invention advantageously enables a designer to be able to efficiently explore the interrelationship between various subparts of a modeled design and its dependant ~~para~~graph, thereby allowing the designer to efficiently leverage on the reuse support offered by CAD tool **100**.--

In the Claims:

Claims 1-8,16, 25, and 26 have been amended as follows:

1. (Amended) In a computer system, ~~A~~ a method of operation comprising:

replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first mechanical design; and

merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.

2. (Amended) The method of operation of claim 1 further comprising receiving identification of the subpart of the first mechanical design, and in response, identifying the sub-graph for replication.

3. (Amended) The method of operation of claim 2, wherein

said first dependent graph includes a first plurality of nodes correspondingly represent a first plurality of design variables of the first mechanical design, and a first plurality of arcs linking the first plurality of nodes in accordance with the first plurality of design variables' dependency on one another; and

said identification of the sub-graph for replication comprises correlating said received identification of the subpart to one or more nodes of said first plurality of nodes

directly associated with the subpart, and following applicable ones of said first plurality of arcs to identify all other nodes of said first plurality of nodes to which the directly associated nodes are directly or indirectly dependent on.

4. (Amended) The method of operation of claim 3 wherein said replication comprises copying said directly associated nodes, said nodes on which the directly associated nodes are dependent on, and the arcs linking these nodes to one another.

5. (Amended) The method of operation of claim 4, wherein

selected ones of the design variables of said replicated sub-graph are set to constant values, while others are eligible to have values variably assigned; and

the method of operation further comprises receiving instructions to transform selected ones of the design variables set to constant values to design variables eligible for having values variably assigned, or to transform selected ones of the design variables eligible for having values variably assigned to having constant values assigned.

6. (Amended) The method of operation of claim 1 further comprising receiving identification of a point or an area of the second mechanical design to reuse the subpart of the first mechanical design in the second mechanical design.

7. (Amended) The method of operation of claim 6, wherein

said second dependent graph includes a second plurality of nodes correspondingly represent a second plurality of design variables of the second mechanical design, and a second plurality of arcs linking the second plurality of nodes in accordance with the second plurality of design variables' dependency on one another; and

said merging comprises correlating said received identification of the point/area to one or more nodes of said second plurality of nodes directly associated with the identified point/area, and attaching the replicated sub-graph to the second dependent graph by selectively linking nodes of the replicated sub-graph to the correlated nodes of the second dependent graph.

8. (Amended) An article of manufacture comprising:

a recordable medium having recorded thereon a plurality of programming instructions for use to program an apparatus to enable the apparatus to be able to replicate a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first mechanical design, and to be able to merge the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.

16. (Amended) An apparatus comprising:

at least one storage medium having stored therein a first and a second plurality of programming instructions; and

at least one processor coupled to the at least on storage medium to execute the first plurality of programming instructions to replicate a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool, the first dependent graph having modeling information of the first mechanical design and the replicated sub-graph having modeling information of a subpart of the first mechanical design, and to execute the second plurality of programming instructions to merge the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.

25. (Amended) An apparatus comprising:

means to replicate a subset of a first modeling representation of a first mechanical design responsive to instructions identifying a subpart of the first mechanical design of a computer aided design (CAD) tool; and

means to merge the replicated subset into a second modeling representation of a second mechanical design of the CAD tool to reuse the identified subpart of the first mechanical design in the second mechanical design.

26. (Amended) In a computer system, A a method of operation comprising the steps of:

replicating a subset of a first modeling representation of a first mechanical design of a computer aided design (CAD) tool responsive to instructions identifying a subpart of the first mechanical design; and

merging the replicated subset into a second modeling representation of a second mechanical design of the CAD tool to reuse the identified subpart of the first mechanical design in the second mechanical design.